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Sandia National Laboratories
Yucca Mountain Site Characterization Project

TECHNICAL PROCEDURE (TP)

**TP-246
Revision 02**

Control of Measuring and Test Equipment Used in the Exploratory Studies Facility

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Revision History

Revision	Revision History
00	Initial issue, effective 9/1/95
01	Minor improvements and, per YM-96-D088, revision to clarify QA record classification requirements.
02	Calibration Request Form revised for consistency with QAIP 12-1, procedure titles corrected, and other minor changes for consistency with requirements and process.

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1.0 SCOPE

Sandia National Laboratories (SNL) is responsible for field experiments in the Exploratory Studies Facility (ESF) and in the surface based testing programs in support of the Yucca Mountain Project (YMP) Site Characterization Plan (SCP). This technical procedure (TP) addresses the control of measuring and test equipment (M&TE) used in the ESF. This TP applies to YMP SNL personnel and contractors for work requiring use of M&TE.

2.0 ACTIVITY OBJECTIVE

The objective of this TP is to define the control methods used to inventory, document calibration, log use, and schedule recalibration in support of SNL YMP in situ experimental activities.

3.0 RESPONSIBILITIES

The Principal Investigator (PI) has responsibility for ensuring that applicable M&TE is controlled and calibrated in accordance with SNL Quality Assurance Implementing Procedure (QAIP) 12-1, "Measuring and Test Equipment Control" and that individuals working on this project are fully aware of the requirements of this TP.

4.0 PREREQUISITES

The PI or PI designee will verify that personnel using this TP have met the following prerequisites:

- Documented that the individual has read the TP and demonstrated proficiency in its use.
- The most current version of this TP is being used.
- Equipment has a current calibration if applicable.

5.0 TECHNICAL INSTRUCTION

Control of M&TE consists of maintaining an Equipment Inventory and Calibration Schedule (EICS), calibration procedures, records requirements, and equipment use records. The following sections provide the requirements and procedures for each of these aspects.

5.1 Equipment Inventory and Calibration Schedule

M&TE items will be given a unique SNL identification number and will be calibrated prior to initial use. Record of the inventory and calibration schedule is maintained on a YMP SNL EICS (as shown in Appendix A). The minimal applicable requirements include the unique SNL identification number, the item description, manufacturer serial

number (when available), manufacturer model number (when available), manufacturer, required accuracy, activity date, initial calibration date, current expiration date, and status.

The YMP SNL EICS is updated with addition of new items, recalibration of M&TE, or M&TE status changes. Changes from previous EICS forms are indicated by shading the added items and revised items on the new form. The PI maintains copies of the EICS forms in chronological order in the calibration records files. Copies of the current EICS forms may be included in the appropriate scientific notebook.

5.2 Calibration

The PI or PI designee maintains a file of copies of calibration records for each item on the M&TE EICS form. Each file should include a chronological calibration history including, but not limited to, manufacturer's QA program documentation (when provided), manufacturer's calibration specifications (when provided), initial calibration certificate, calibration data, Calibration Check Sheet (Appendix B), Calibration Request form (Appendix C), calibration procedures specific to each M&TE item, documentation of vendor approval, and any additional correspondence relative to calibration and performance of each item. The PI ensures that current Calibration Check Sheets and Calibration Request forms are used.

The Calibration Check Sheet is completed by the PI or PI designee prior to initial use of the M&TE and prior to use following recalibration. The PI will mark any check items with "NA" when not applicable for a given piece of M&TE. The PI may document additional information on this form by initialing and dating comments.

The PI or PI designee gives final approval of the calibration qualifying the instrument for use. An acceptance memorandum or an initial acceptance of the Calibration Request form by the PI is kept in the calibration records files and submitted as project records. General calibration is conducted on an annual basis unless otherwise documented on the EICS.

Calibration requesters sending equipment for calibration must ensure that the calibrations are performed in compliance with QAIP 12-1.

The minimal requirements are included on the SNL Calibration Request form. The PI can document exceptions or deletions to these requirements by initialing and dating changes on the form or by attaching a memorandum explaining the exceptions or deletions to the Calibration Request form. OQA concurrence on the SNL Calibration Request form is required before the form is transmitted.

5.3 Recall Requirements

M&TE that has not been properly maintained or calibrated within the specified schedule shall be tagged or segregated, and removed from service. This equipment can be placed back into service upon successful recalibration per Section 5.2 above.

5.4 Equipment Use Records

The unique SNL identification number for each piece of M&TE will be recorded on data collection forms or in field notebooks. These data collection records include hard copies documenting use of specific M&TE. In addition, these references are entered into a computer database which tracks use of all M&TE. The impact of identified malfunctions or problems with any M&TE can be evaluated based on past use via the computer database or data collection records.

6.0 RECORDS

Records and record packages, including corrections and changes thereto, generated as a result of implementing this procedure shall be prepared and submitted as lifetime QA records (QA:L) to the SNL Local Records Receiving Organization by the record source in accordance with the requirements of QAIP 17-1.

QA records generated by this procedure include:

- Documentation of proficiency in the use of this procedure;
- YMP SNL Inventory and Calibration Schedule;
- Calibration Check Sheets; and
- Calibration Request Forms.

7.0 REFERENCES

QAIP 12-1, "Measuring and Test Equipment Control," Sandia National Laboratories, Albuquerque, NM.

QAIP 17-1, "Creating, Protecting, and Processing CRWM Records," Sandia National Laboratories, Albuquerque, NM.

8.0 APPENDIXES

Appendix A. Example of YMP SNL Equipment Calibration Schedule (1 page)

Appendix B. Example of Calibration Check Sheet (1 page)

Appendix C. Example of Calibration Request Form (1 page)

YMP SNL EQUIPMENT INVENTORY AND CALIBRATION SCHEDULE

SNL #	ITEM	SERIAL #	MODEL #	MANUFACTURE	ACCURACY REQUIRED	ACTIVITY DATE	INITIAL CAL DATE	EXPIRATION DATE	STATUS	PTL #
001	100 ft Tape Extensometer	820401-1	-	Terrametries Inc.	1.0 In	04/27/93	04/27/93	NONE	Active	
002	50 ft Tape Extensometer	820331-2	-		1.0 In	04/27/93	04/27/93	NONE	Active	
003	CSI Datalogger	17767	CR10	Cambell Scientific	*	02/14/94	05/25/93	02/14/95	Active	
004	Decade Box	51586	1432-P	General Radio Co.	*	07/21/94			Cal Lab	
005	Multimeter	SNL 005	260-8P	Simpson	*	08/04/94			Cal Lab	
006	Digital Thermometer	-	PT-100	Sealed Unit Parts Co	2 degrees F	09/29/94	01/03/94	01/03/95	Off Line	Y10908
007	Everlert 6000 - Geophone	-	006020	Everlert Inc	+/- 1 decibel	03/23/94	03/28/93		Off Line	
008	Everlert 6000 - Geophone	-	006076	Everlert Inc.	+/- 1 decibel	03/29/94	03/29/93		Off Line	
009	Everlert II - Geophone	-	7017	Everlert Inc.	+/- 1 decibel	03/16/94	03/18/93		Off Line	
010	Length Static Frame	-	-	Geokon	0.001 In	08/01/94	08/07/94	NONE	Active	Y11236
011	Multimeter	50120612	23	John Fluke Corp.	*	09/06/94	12/29/94	12/29/95	Active	
012	Dial Indicator	-	2424	Mitutoyo	0.002 In	09/15/94	11/16/93	09/15/95	Active	Y10658
013	Ohm Meter	49-12970-2	310 T6	Triplett Corp.					Off Line	
014	Oscilloscope	9030186	LB0315	Leader	*	08/04/94			Cal Lab	
015	Pressure gage	-	1082	Ashcroft	50 psi	07/27/94	07/23/93	07/27/95	Active	Y10746
016	Thermometer	6075130	52 K/J	John Fluke Corp.	1 deg F	09/14/94	09/14/94	09/14/95	Active	Y11281
017	Vibrating Wire Readout Box	516	GK-401	Geokon	0.5 sec	09/07/94	03/11/93	09/07/95	Active	
018	VTM	008200	936	Data Precision	*	08/04/94			Cal Lab	
019	Schmidt Concrete Test Hammer								Off Line	
020	Thermometer	5160250	51 K/J	John Fluke Corp	1 deg F		01/01/94		Off Line	
021	CSI CR10 Datalogger	23435	CR10	Cambell Scientific	*	01/13/95	01/18/95		Active	
022										
023										
024										

* Calibration required to be within manufacture's specifications

Shaded area indicates a change from last issue

cal schedule

13:54 1/27/95

Appendix A. Example of YMP SNL Equipment Calibration Schedule

CALIBRATION CHECK SHEET

DATE: _____ NAME: _____ INITIAL: _____

GAGE TYPE: _____ SNL NUMBER: _____

CHECK	ITEMS TO CHECK FOR
	The name and serial number identifying the device calibrated
	The date of the calibration
	Identification of the calibration procedure and revision used
	Calibration data: standards values versus device readings
	Identification of the calibration equipment and measurement standards used; traceable to NIST
	For calibrations that may require calculations to determine accuracy, the calculations shall receive an independent technical review to determine acceptability of the calibration
	A quantitative statement of the accuracy for the device including results of the calibration and a statement of acceptability
	The date the next calibration is due, if required by SNL YMP PI
	The printed name and signature of the person responsible for the calibration function or who performed the calibration
	A label on the equipment with the date the calibration performed, expiration date, and name of the calibration laboratory

Appendix B. Example of Calibration Check Sheet

Sandia National Laboratories
P.O. Box 288
Mercury, NV 89029

CALIBRATION REQUEST

All calibrating organizations shall comply with Yucca Mountain Project (YMP) quality assurance requirements for calibration.

Information supplied to calibration organization:

1. Type of measuring or test equipment: _____
2. ID or serial number: _____
3. Acceptable accuracy of calibration: _____
4. Calibration points: _____
5. Re-calibration date: _____

Information required from the calibrating organization to generate an approved calibration record:

1. Name and serial number of the device calibrated.
2. Date of calibration.
3. Identification of the procedure or instructions used in calibration (including revision number).
4. Calibration data: standards values versus device readings.
5. Identification of the calibration equipment and measurement standards used; traceable to NIST.
6. A quantitative statement of the accuracy, and acceptability.
7. The printed name and signature of the person responsible for the calibration.
8. A label will be attached to the device, if possible, indicating the calibrating organization with both the calibration and re-calibration dates.

Calibrating organization _____

Calibration Requester _____ **Phone** _____ **Date** _____

WBS# _____ **Study Plan #** _____ **Case #** _____

Calibration acceptance, PI Initial _____ **Date returned to use** _____

OQA Concurrence: _____ **Phone** _____ **Date** _____

Appendix C. Example of Calibration Request Form